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6 BEFORE THE STATE OF WASHINGTON
7 ENERGY FACILITY SITE EVALUATION COUNCIL

8
9 In the Matter of Application No. 99-1:

10 SUMAS ENERGY 2 GENERATION
11 FACILITY
12

Exhibit _____ (DVB-T)

PRE-FILED TESTIMONY OF DAVID
BATES

13 **Q: Please introduce yourself.**

14 A: My name is David Bates.

15
16 **Q: What is your background and experience?**

17 A: I am a physician with 50 years of experience in occupational and environmental
18 medicine, specializing in respiratory disease related to air pollutants. I am a consultant
19 to the international scientific and regulatory communities on matters of environmental
20 medicine, air pollution, science policy, and medical education. I have served and/or
21 continue to serve on numerous government advisory bodies including the National
22 Academy of Science (Board of Environmental Studies and Toxicology); United States
23 EPA Science Advisory Board on air pollution and health related matters; and the
Lower Fraser Valley Air Quality Advisory Committee. I have served as a visiting
professor at various universities including Harvard, Johns Hopkins, and McGill
University. I continue to serve as a Criteria Document peer reviewer for the United
States EPA Clean Air Science Advisory Committee.

14 I have been an independent consultant in occupational environmental medicine since
15 1987. Prior to that, for 15 years I was on the faculty at the University of British
16 Columbia, including time as the Dean of the Faculty of Medicine. Prior to that, I was

1 at McGill University where my roles included being chair of the Department of
2 Physiology and Associate Dean of the Faculty of Medicine. My background is further
described in my curriculum vitae. Exhibit ____ (DVB-1).

3 **Q: What is the subject of your pre-filed testimony?**

4 A: My testimony deals with the health effects associated with the increased pollution
5 predicted to result from the SE2 facility. However, I understand that this is the
6 resumption of hearings that initially took place last year and that the scope of these
7 hearings is limited to considering the implication of changes in the project as described
8 in SE2's Second Revised Application. I have focused my efforts within that limited
scope.

9 **Q: What work have you undertaken to address these issues?**

10 A: I am continually reviewing new scientific studies related to air quality and related
11 health effects. Specific to this matter, I have reviewed relevant sections of the
following documents:

12 § The Second Revised Application (Jun., 2001).

13 § The First Amended Application (Jan., 2000).

14 § EFSEC Order No. 754.

15 § The Pre-Filed Testimony of Applicant=s witnesses Eric Hansen and Sanya
16 Petrovic.

17 **Q: Can you summarize your conclusions based on this review?**

18 A: Yes. First, given the limited scope of this round of hearings, I will not re-hash the old
19 evidence germane to establishing that adverse health effects do occur at levels below
20 regulatory standards. (I understand Robert Caton's testimony demonstrates the failure
21 of Ms. Petrovic to observe this limitation). However, there are new health studies that
22 do have relevance. By Anew,@ I mean studies that have been published subsequent to
23 the close of the hearings last fall. These new studies have not been cited or discussed
24 by Ms. Petrovic. These studies confirm the other studies already cited in the record
25 which establish that serious health effects do occur below the regulatory standards.

26 Second, Ms. Petrovic argues, in essence, that SE2's emissions will be slight in
27 comparison to background conditions and that this slight increase will not have any
demonstrable health effects. I note first that Ms. Petrovic=s testimony is apparently

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1 based on inaccurate or incomplete projections of the facility=s emissions, as detailed
2 by Mr. LePage. In any event, Ms. Petrovic is wrong because the facility=s proposed
3 additions to background pollution levels can be expected to increase the incidence of
4 adverse health effects.

5 Third, and related to the prior point, Ms. Petrovic=s testimony is at odds with the vast
6 body of scientific literature that indicates that there is no threshold below which these
7 pollutants do not cause health problems and that, as these pollution levels increase, so
8 does the risk of adverse health impacts. Indeed, her characterization of the more
9 lenient standards as being a compromise between protecting health and allowing for
10 new development is an implied acknowledgment that adverse effects occur below
11 those politically established levels.

12 Fourth, Mr. Hansen is incorrect in suggesting that the Council should focus on health
13 effects caused by short-term exposures to air pollution and apparently ignore or give
14 little weight to health effects caused by long-term exposures. Both short and long-term
15 exposures are important from a health effects perspective. That=s why, among other
16 things, air pollution standards and guidelines address both short-term and long-term
17 exposure levels.

18 17: Let=s start with your first point. While the Council already has determined
19 that health effects occur below the level of Canadian standards and objectives, the
20 Council may desire to learn of new information (subsequent to the last hearing)
21 pertaining to this issue. If so, are there any new health studies published since the
22 close of the first round of hearings last fall that are germane to this issue?

23 A: Yes. There was a study published very recently that demonstrates the onset of adverse
24 health effects in humans that are exposed to ozone and soot (small particulate matter)
25 at levels below the Canadian objectives and standards. The study was conducted in
26 Atlanta, Georgia at the time of the summer Olympics there in 1996. Due to a *decrease*
27 in vehicle traffic during the Olympics, there was a 20 ppb reduction in ozone levels.
28 The study found that this was associated with a 35 percent reduction in hospital
29 admissions of children with asthma. At all times, ozone levels were below both the
30 current United States and Canadian standards for ozone. (The paper is entitled *AThe*
31 *Impact of Changes in Transportation and Commuting Behavior During the 1996*
32 *Summer Olympic Games in Atlanta on Air Quality and Childhood Asthma.*@ It is
33 authored by Friedman and others and was published earlier this year in the *Journal of*
34 *the American Medical Association*, Volume 285, pages 897-905.)

35 Q: Does Ms. Petrovic base her **Ano adverse health impacts@ conclusion on anything**
36 **other than her comparison of SE2 induced pollution levels to Canadian standards**
37 **and objectives?**

1 A: Yes. Early in her testimony, she identifies a second basis for her adverse health
2 impacts@ conclusion. She asserts that because the increases in particulate matter and
3 ozone from the SE2 facility will be a small fraction of current background
4 concentrations that there will be no adverse health impacts from those emissions.
Exhibit 183 at 6:20-29. She elaborates on this briefly near the end of her testimony at
pages 21-22.

5 **Q: In your summary at the outset of your testimony, you stated that you disagreed**
6 **with that part of her testimony, too. Could you please expand on that point now?**

7 A: Yes. As I mentioned at the outset, there are really two problems with this part of Ms.
8 Petrovic=s testimony. First, her analysis is based on emission levels and projected
9 concentration levels that do not take into account peak emissions that apparently will
10 occur during start-ups and shut-downs. This matter is discussed in greater detail in
11 Michael LePage=s testimony. But the point here is to relate that oversight to the health
effects analysis. This part of her testimony is based on the amount of emissions from
the facility, yet she is apparently relying on information that underestimates those
emissions.

12
13 But the more important point, really, is that Ms. Petrovic simply is wrong to assert that
14 increases in pollution do not translate to increases in adverse health effects. For both
of the pollutants at issue here, small particulate matter and ozone, it has long been
15 recognized that as the concentration increases, so does the risk of adverse health
effects. The Atlanta study I mentioned demonstrates that. So do two other recent
16 ones.

17 One of them was a study of 6,000 school children in Los Angeles. The authors found
18 that an increase of 20 ppb of O₃ [ozone] was associated with an increase of 62.9
19 percent for illness-related absent rates, 82.9 percent for respiratory illnesses, 45.1
percent for upper respiratory illnesses, and 173.9 percent for lower respiratory illnesses
with wet cough.@ Gauderman, et al., *The Effects of Ambient Air Pollution on*
20 *School Absenteeism Due to Respiratory Illness*,@ 12 *Epidemiology*, 43-54 (2001).

21 The other was conducted in Boston, Massachusetts, and reported a highly significant
22 association between the occurrence of acute heart attacks in 772 individuals and the
23 level of particulate pollution. Peters, et al., *Increased Particulate Air Pollution and*
the Triggering of Myocardial Infarction,@ 103 *Circulation*; 2810-15 (2001). All of
24 these studies corroborate the findings of earlier studies that indicate that as exposure
increases, so does the risk of adverse health effects and that there has been no
25 demonstrated threshold below which these effects do not occur.

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1 By the way, I notice that in this part of her testimony (pages 21-22), Ms. Petrovic cites
2 no studies (old or new) to support her assertion that increases in pollution do not
increase health risks.

3 Furthermore, later in her testimony she effectively contradicts herself. When speaking
4 about the offsets proposal, she states that efforts to improve air quality by offsetting
5 emissions or funding other air quality improvements will have a Apositive@ effect on
6 health. I agree that when we reduce air pollution, that has a positive impact on health
7 risk. But, then, the converse is necessarily true, too. When pollution increases, there is
an adverse impact on health risk. Ms. Petrovic cannot logically claim that decreases in
pollution from an offset program will be protective of health and at the same time
claim that increases in air pollution will not have an impact on health.

8 **Q: Mr. Hansen suggests that the Council=s focus should be on peak levels of**
9 **pollution, not annual averages. Do you agree?**

10 A: No, there should be focus on both. If the health studies indicated that only peak levels
11 were of concern, then you would see regulatory standards expressed only in terms of
12 short-term peak values. Instead, the health community recognizes that both long-term
13 and short-term exposures are important from a health perspective. The Joint Technical
Report (Exhibit 162.12) demonstrated that the primary health effects from exposures to
14 particulates were due primarily to the long-term elevation of ambient concentrations of
particulate matter, not the short-term peaks associated with burning diesel.

15 **Q: In light of the changes SE2 has made to the project, how would you assess the**
16 **need for the Council to revise its determination that Sumas is not an appropriate**
location for this project from a public health standpoint?

17 A: I see no need for the Council to revise that determination. The reductions in emissions
18 attributable to the changes in the project are very slight and therefore the reduction of
adverse health effects would be very slight, too.

19 Further, it is my understanding that the emissions of some pollutants is increasing. For
20 instance, I understand that (apparently because of an error in the earlier application) the
21 current application shows a large increase in the emissions of sulphuric acid mist and
22 sulphur dioxide. When released into the atmosphere, these pollutants react with other
chemicals and create very small particulates, i.e., PM-2.5. Thus, these new, higher
23 emission levels for sulphuric acid mist and sulphur dioxide would be expected to have
an adverse effect on health.

24 Essentially, the magnitude of the adverse health effects that supported the Council=s
25 conclusions last time remain virtually the same. Last time the Council determined that
26 this Apolluted, confined, highly populated and rapidly growing area is not an

1 appropriate site in which to locate a power plant, which would emit three tons a day of
2 criteria and toxic pollutants.@ Council Order No. 754 at 51 (Finding 47). The
3 information that this valley is Apolluted, confined, highly populated, and rapidly
4 growing@ has not changed. The slight reduction in emissions (six or seven percent
5 reduction, at best, ignoring potentially higher levels during start-up and shut-down)
6 does not warrant a change in the Council=s fundamental conclusions.

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END OF TESTIMONY

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